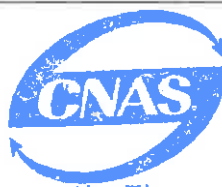




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CNAS L2999

TEST REPORT OF CLASSIFICATION FOR DANGEROUS GOODS – LITHIUM METAL AND LITHIUM ION BATTERIES

Report ID: 2016046J2781

Sample Name: Lithium-ion Battery Pack

Model/Type: BT-E8020

Applicant: Sony Electronics (Wuxi) Co., Ltd.



CQC Intime Testing Technology Co.,Ltd



TEST REPORT

Report ID: 2016046J2781**Project Leader:** 沙海勇**Signature:** **Verdict:** 曹 玮**Signature:** **Issued By:** 邓 爽**Signature:** **Date of Issue:** May. 20, 2016**Test Unit:** CQC Intime Testing Technology Co., Ltd**Address:** East Taihu Technology and Finance City, No.1368 Wuzhong Dadao Rd., Wuzhong Economic Development Zone, Suzhou, Jiangsu.**Postal code:** 215104 **Phone:** 0512-66303623 **Fax:** 0512-66303625**Testing location/procedure:** East Taihu Technology and Finance City, No.1368 Wuzhong Dadao Rd., Wuzhong Economic Development Zone, Suzhou, Jiangsu.**Applicant's name:** Sony Electronics (Wuxi) Co., Ltd..**Address:** No.27, Changjiang Road, New District, Wuxi, Jiangsu Province**Sample Name:** Lithium-ion Battery Pack**Trade Mark:** SHIMANO**Model/Type:** BT-E8020**Ratings:** 36V 14.0Ah**Manufacturer:** Sony Electronics (Wuxi) Co., Ltd..**Address:** No.27, Changjiang Road, New District, Wuxi, Jiangsu Province**Standard Specification:** UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3. Rev.5**Test Procedure:** —**Non-standard Test Method:** —**Test Item:** Altitude Simulation, Thermal Test, Vibration, Shock, External Short Circuit, Impact, Overcharge, Force Discharge**Date of receipt of test item:** Apr. 12, 2016**Test Period:** Apr. 14, 2016 ~ May. 16, 2016**Conclusion:** The Submitted Sample(s) Meet the Requirement of the Standard.**Testing Conditions:** Temperature: 21.5℃ ~ 25.2℃ Relative Humidity: 53.7%~65.5%

Battery Critical Component List

No	Name	Model/Type	Manufacturer	Remarks
1	BMS	BQ77PL900	Texas Instruments	--
2	Cell	18650VC7	--	--
3	Intercell tabs	Ni	--	--
4	Plastics cases and Lida	PC	KINGFA	--
5	Fuse	--	--	--
6	--	--	--	--
7	--	--	--	--
8	--	--	--	--
9	--	--	--	--
10	--	--	--	--

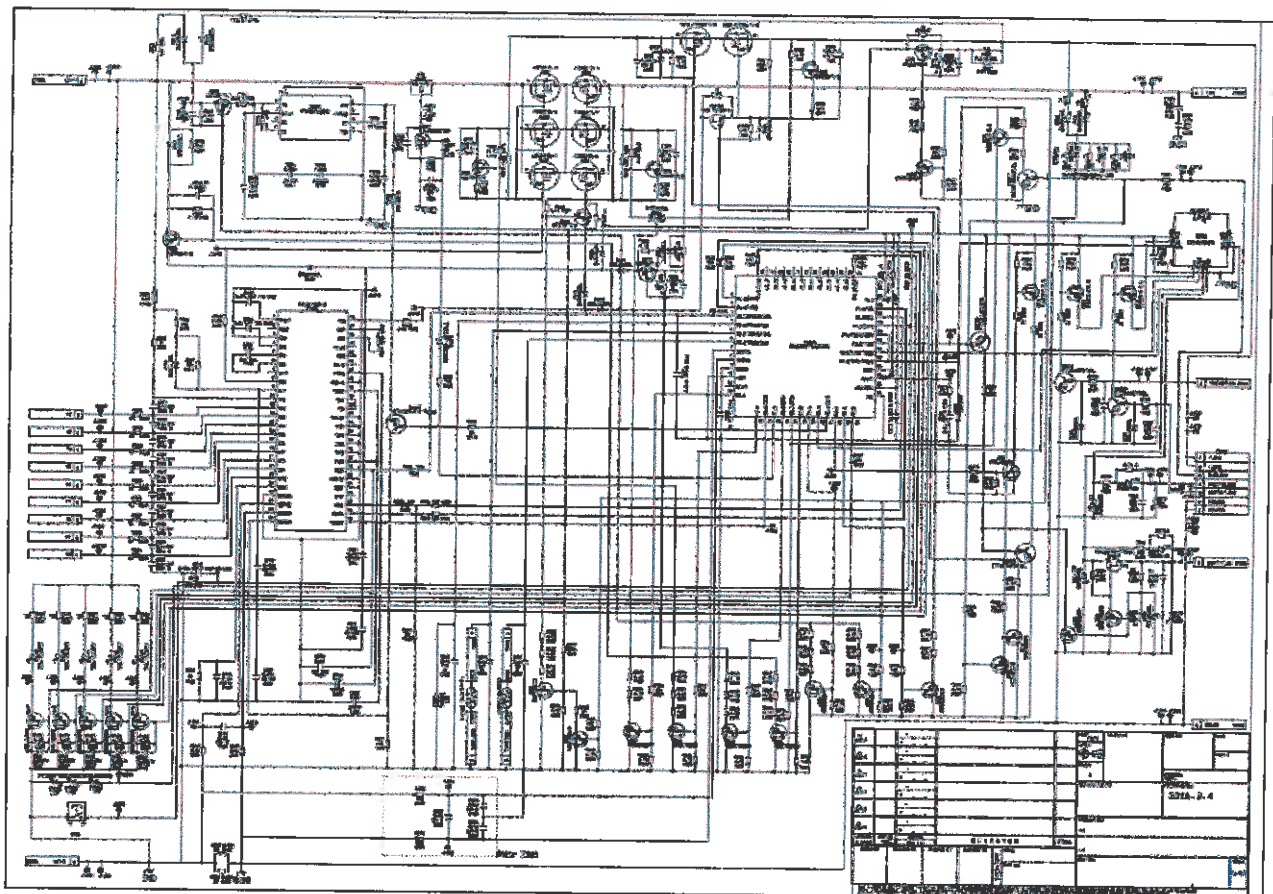
Cell Main Chemical Composition

No	Name	Component	Manufacturer	Remarks
1	Cathode material	Lithium Nickel Cobalt Aluminum Oxides	--	--
2	Anode material	Graphite Silicon Monoxide	--	--
3	Conductive agent	Graphite	--	--
4	Binder	Styrene-butadiene rubber Polyvinylidene fluoride	--	--
5	Seperator	Polyethylene	--	--
6	Electrolyte	Organic Solvent	--	--
7	--	--	--	--
8	--	--	--	--
9	--	--	--	--
10	--	--	--	--

The Table of Battery Fundamental Parameters

Item	Rated Performance	Item	Rated Performance
Nominal capacity (Ah)	14.0	Nominal voltage(V)	36.0
Rated power(Wh)	504.00	Limited charge voltage(V)	42.0
Charge current(A)	4.36A(~40V) 4.0A(40~42V)	Maximum continous charging current (A)	6.0
End charge current(mA)	500.0	Discharge current(A)	20.0
Cut-off voltage (V)	30.0	Cell numbers	40
Maximum discharge current(A)	30A/5s	Type of cell(mm)	Cylindrical $\phi\leq 20$
Permutation of cell	10S4P	Capacity of cell(Ah)	3.5

The Battery Electrical Connection Diagram



Sample photograph-1



Sample photograph-2



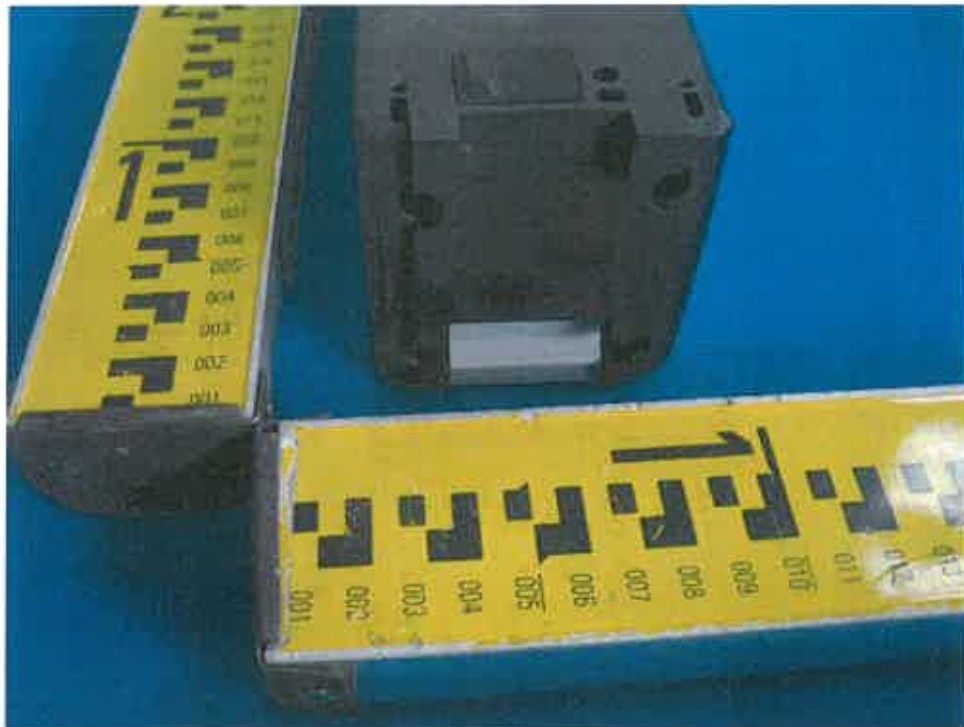
Sample photograph-3



Sample photograph-4



Sample photograph-5



Sample photograph-6



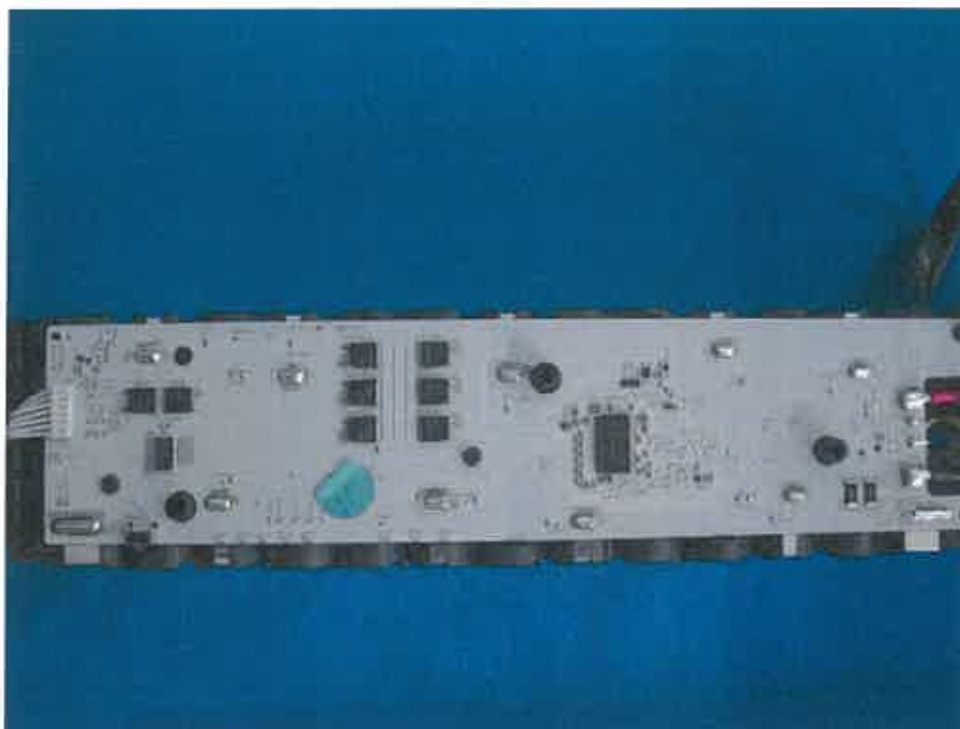
Sample photograph-7



Sample photograph-8



Sample photograph-9



Sample photograph-10



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TEST REPORT

Test results

UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.1 Altitude simulation	Battery at first cycle in fully charged state. Test batteries shall be stored at a pressure of 11.6 kPa or less for at least six hours at ambient temperature ($20 \pm 5^\circ\text{C}$).	No leakage No venting No disassembly No rupture No fire The open circuit voltage of each test battery after testing is not less than 90% of its voltage, Mass loss limit 0.1%.	/	Group1 Group2 Group3 Group4	No leakage No venting No disassembly No rupture No fire The open circuit voltage of each test battery after testing is not less than 90% of its voltage. No mass loss. Test data is shown in Annex 1.	P
	Battery after 50 cycles in fully charged state. Test batteries shall be stored at a pressure of 11.6 kPa or less for at least six hours at ambient temperature ($20 \pm 5^\circ\text{C}$).			Group5 Group6 Group7 Group8		P

*When mass loss does not exceed the limited value, it shall be considered as "no mass loss".

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Test results

UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.2 Thermal test	Battery at first cycle in fully charged state. Test batteries are to be stored for at least six hours at a test temperature equal to $72\pm 2^{\circ}\text{C}$, followed by storage for at least six hours at a test temperature equal to $-40\pm 2^{\circ}\text{C}$. The maximum time interval between test temperature extremes is 30 minutes. This procedure is to be repeated 10 times, after which all test batteries are to be stored for 24 hours at ambient temperature ($20\pm 5^{\circ}\text{C}$).	No leakage No venting No disassembly No rupture No fire The open circuit voltage of each test battery after testing is not less than 90% of its voltage, Mass loss limit 0.1%.	/	Group1 Group2 Group3 Group4	No leakage No venting No disassembly No rupture No fire The open circuit voltage of each test battery after testing is not less than 90% of its voltage.	P
	Battery after 50 cycles in fully charged state. Test batteries are to be stored for at least six hours at a test temperature equal to $72\pm 2^{\circ}\text{C}$, followed by storage for at least six hours at a test temperature equal to $-40\pm 2^{\circ}\text{C}$. The maximum time interval between test temperature extremes is 30 minutes. This procedure is to be repeated 10 times, after which all test batteries are to be stored for 24 hours at ambient temperature ($20\pm 5^{\circ}\text{C}$).			Group5 Group6 Group7 Group8	No mass loss. Test data is shown in Annex 2.	P

*When mass loss does not exceed the limited value, it shall be considered as "no mass loss".

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Test results

UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.3 Vibration	<p>Battery at first cycle in fully charged state.</p> <p>Batteries are firmly secured to the platform of the vibration machine without distorting the cells. The vibration shall be a sinusoidal waveform with a logarithmic sweep between 7 Hz and 200 Hz and back to 7 Hz traversed in 15 minutes. This cycle shall be repeated 12 times for a total of 3 hours for each of three mutually perpendicular mounting positions of the cell. One of the directions of vibration must be perpendicular to the terminal face. The logarithmic frequency sweep is as follows: from 7 Hz a peak acceleration of 1 g_n is maintained until 18 Hz is reached. The amplitude is then maintained at 0.8 mm (1.6 mm total excursion) and the frequency increased until a peak acceleration of 8 g_n occurs (approximately 50 Hz). A peak acceleration of 8 g_n is then maintained until the frequency is increased to 200 Hz.</p>	<p>No leakage No venting No disassembly No rupture No fire The open circuit voltage of each test battery after testing is not less than 90% of its voltage, Mass loss limit 0.1%.</p>	/	<p>Group1 Group2 Group3 Group4</p>	<p>No leakage No venting No disassembly No rupture No fire The open circuit voltage of each test battery after testing is not less than 90% of its voltage No mass loss. Test data is shown in Annex 3.</p>	P

*When mass loss does not exceed the limited value, it shall be considered as "no mass loss".

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Test results

UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.3 Vibration	<p>Battery after 50 cycles in fully charged state.</p> <p>Batteries are firmly secured to the platform of the vibration machine without distorting the cells. The vibration shall be a sinusoidal waveform with a logarithmic sweep between 7 Hz and 200 Hz and back to 7 Hz traversed in 15 minutes. This cycle shall be repeated 12 times for a total of 3 hours for each of three mutually perpendicular mounting positions of the cell. One of the directions of vibration must be perpendicular to the terminal face. The logarithmic frequency sweep is as follows: from 7 Hz a peak acceleration of 1 g_n is maintained until 18 Hz is reached. The amplitude is then maintained at 0.8 mm (1.6 mm total excursion) and the frequency increased until a peak acceleration of 8 g_n occurs (approximately 50 Hz). A peak acceleration of 8 g_n is then maintained until the frequency is increased to 200 Hz.</p>	<p>No leakage No venting No disassembly No rupture No fire The open circuit voltage of each test battery after testing is not less than 90% of its voltage, Mass loss limit 0.1%.</p>	/	Group5 Group6 Group7 Group8	<p>No leakage No venting No disassembly No rupture No fire The open circuit voltage of each test battery after testing is not less than 90% of its voltage No mass loss . Test data is shown in Annex 3.</p>	P

*When mass loss does not exceed the limited value, it shall be considered as "no mass loss".

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Test results

UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.4 Shock	<p>Battery at first cycle in fully charged state.</p> <p>Test batteries shall be secured to the testing machine by means of a rigid mount which will support all mounting surfaces of each test battery.</p> <p>Each battery shall be subjected to a half sine shock of peak acceleration of 150 g_n and pulse duration of 6 milliseconds.</p> <p>Each battery shall be subjected to three shocks in the positive direction followed by three shocks in the negative direction of three mutually perpendicular mounting positions of the battery for a total of 18 shocks.</p>	<p>No leakage No venting No disassembly No rupture No fire The open circuit voltage of each test battery after testing is not less than 90% of its voltage, Mass loss limit 0.1%.</p>	/	<p>Group1 Group2 Group3 Group4</p>	<p>No leakage No venting No disassembly No rupture No fire The open circuit voltage of each test battery after testing is not less than 90% of its voltage. No mass loss . Test data is shown in Annex 4.</p>	P

*When mass loss does not exceed the limited value, it shall be considered as "no mass loss".

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Test results

UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.4 Shock	<p>Battery after 50 cycles in fully charged state.</p> <p>Test batteries shall be secured to the testing machine by means of a rigid mount which will support all mounting surfaces of each test battery.</p> <p>Each battery shall be subjected to a half sine shock of peak acceleration of 150 g_n and pulse duration of 6 milliseconds.</p> <p>Each battery shall be subjected to three shocks in the positive direction followed by three shocks in the negative direction of three mutually perpendicular mounting positions of the battery for a total of 18 shocks.</p>	<p>No leakage No venting No disassembly No rupture No fire The open circuit voltage of each test battery after testing is not less than 90% of its voltage, Mass loss limit 0.1%.</p>	/	<p>Group5 Group6 Group7 Group8</p>	<p>No leakage No venting No disassembly No rupture No fire The open circuit voltage of each test battery after testing is not less than 90% of its voltage. No mass loss . Test data is shown in Annex 4.</p>	P

*When mass loss does not exceed the limited value, it shall be considered as "no mass loss".

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Test results

UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.5 External short circuit	<p>Battery at first cycle in fully charged state.</p> <p>The cell or battery to be tested shall be temperature stabilized so that its external case temperature reaches $55\pm 2^{\circ}\text{C}$ and then the cell or battery shall be subjected to a short circuit condition with a total external resistance of less than 0.1 ohm at $55\pm 2^{\circ}\text{C}$. This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to $55\pm 2^{\circ}\text{C}$. The battery must be observed for a further six hours for the test to be concluded.</p>	<p>External temperature does not exceed 170°C. No disassembly No rupture No fire</p>	/	<p>Group1 Group2 Group3 Group4</p>	<p>External temperature does not exceed 170°C. No disassembly No rupture No fire Test data is shown in Annex 5.</p>	P

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Test results

UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.5 External short circuit	<p>Battery after 50 cycles in fully charged state.</p> <p>The cell or battery to be tested shall be temperature stabilized so that its external case temperature reaches $55\pm 2^{\circ}\text{C}$ and then the cell or battery shall be subjected to a short circuit condition with a total external resistance of less than 0.1 ohm at $55\pm 2^{\circ}\text{C}$. This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to $55\pm 2^{\circ}\text{C}$. The battery must be observed for a further six hours for the test to be concluded.</p>	<p>External temperature does not exceed 170°C. No disassembly No rupture No fire</p>	/	<p>Group5 Group6 Group7 Group8</p>	<p>External temperature does not exceed 170°C. No disassembly No rupture No fire Test data is shown in Annex 5.</p>	P

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Test results

UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.6 Impact	<p>Cell at first cycle at 50% of the design rated capacity.</p> <p>The sample cell or component cell is to be placed on a flat smooth surface. A 15.8 mm \pm 0.1mm diameter, at least 6 cm long, or the longest dimension of the cell, whichever is greater, Type 316 stainless steel bar is to be placed across the centre of the sample. A 9.1 kg \pm 0.1 kg mass is to be dropped from a height of 61 \pm 2.5 cm at the intersection of the bar and sample in a controlled manner using a near frictionless, vertical sliding track or channel with minimal drag on the falling mass. The vertical track or channel used to guide the falling mass shall be oriented 90 degrees from the horizontal supporting surface.</p> <p>The test sample is to be impacted with its longitudinal axis parallel to the flat surface and perpendicular to the longitudinal axis of the 15.8 mm \pm 0.1mm diameter curved surface lying across the centre of the test sample. Each sample is to be subjected to only a single impact. The battery must be observed for a further six hours for the test to be concluded.</p>	<p>External temperature does not exceed 170°C.</p> <p>No disassembly</p> <p>No fire</p>	/	<p>1 #</p> <p>2 #</p> <p>3 #</p> <p>4 #</p> <p>5 #</p>	<p>External temperature does not exceed 170°C.</p> <p>No disassembly</p> <p>No fire</p> <p>Test data is shown in Annex 6.</p>	P

*: Component Cells Of Battery.

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Test results

UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.7 Overcharge	<p>Battery at first cycle in fully discharged state.</p> <p>The charge current shall be the twice the manufactures recommended maximum continuous charge current. The minimum voltage of the test shall be follows:</p> <p>(a) When the manufactures recommended charge voltage is not more than 18V, the minimum voltage of the test shall be the lesser of two times the maximum charge voltage of the battery or 22V.</p> <p>(b) When the manufactures recommended charge voltage is more than 18V, the minimum voltage of the test shall be 1.2 times the maximum charge voltage.</p> <p>Tests are to be conducted at ambient temperature. The duration of the test shall be 24 hours. The test sample shall be observed for a further 7 days.</p>	<p>No disassembly No fire</p>	/	<p>Group 9 Group10 Group11 Group12</p>	<p>No disassembly No fire Test data is shown in Annex 7</p>	P

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Test results

UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.7 Overcharge	<p>Battery after 50 cycles in fully charged state.</p> <p>The charge current shall be the twice the manufactures recommended maximum continuous charge current. The minimum voltage of the test shall be follows:</p> <p>(c) When the manufactures recommended charge voltage is not more than 18V, the minimum voltage of the test shall be the lesser of two times the maximum charge voltage of the battery or 22V.</p> <p>(d) When the manufactures recommended charge voltage is more than 18V, the minimum voltage of the test shall be 1.2 times the maximum charge voltage.</p> <p>Tests are to be conducted at ambient temperature. The duration of the test shall be 24 hours. The test sample shall be observed for a further 7 days.</p>	<p>No disassembly No fire</p>	/	<p>Group13 Group14 Group15 Group16</p>	<p>No disassembly No fire Test data is shown in Annex 7</p>	P

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Test results

UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.8 Forced discharge	<p>Battery at first cycle in fully discharged state.</p> <p>Each cell shall be forced discharged at ambient temperature by connecting it in series with a 12V D.C. power supply at an initial current equal to the maximum discharge current specified by the manufacturer. The specified discharge current is to be obtained by connecting a resistive load of the appropriate size and rating in series with the test cell. Each cell shall be forced discharged for a time interval (in hours) equal to its rated capacity divided by the initial test current (in ampere). The test sample shall be observed for a further 7 days.</p>	No disassembly No fire	/	6#-15#	No disassembly No fire Test data is shown in Annex 8	P

*: Component Cells Of Battery.

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Test results

UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3

Clause	Test item	Specification	Unit	Sample ID	Test results	Pass/Fail Conclusion
38.3.4.8 Forced discharge	<p>Battery after 50 cycles in fully charged state.</p> <p>Each cell shall be forced discharged at ambient temperature by connecting it in series with a 12V D.C. power supply at an initial current equal to the maximum discharge current specified by the manufacturer. The specified discharge current is to be obtained by connecting a resistive load of the appropriate size and rating in series with the test cell. Each cell shall be forced discharged for a time interval (in hours) equal to its rated capacity divided by the initial test current (in ampere). The test sample shall be observed for a further 7 days.</p>	No disassembly No fire	/	16#-25#	No disassembly No fire Test data is shown in Annex 8	P

*: Component Cells Of Battery.

CQC Intime Testing Technology Co., Ltd

TEST REPORT

List of Test Equipment

No	Test Equipment	Equipment Model	Equipment No	Expiry Date of Calibration	Remarks (√)
1	Low Pressure Chamber	315Z	ITCS1206013	2016.07.30	√
2	Thermal Shock Chambers	PHV1512-DW	ITCB13012	2016.10.08	√
3	Electric Vibration Test System	HV-300-D-25	ITCEN07007	2016.08.03	√
4	Battery Shock Tester	H-V-100	ITCEN07008	2016.08.03	√
5	High Temperature Explosion-proof Chamber	SPHH-101	ITCS06031	2016.11.22	√
6	Electric Vehicle Battery Tester	BNT100-0100ME	ITCB13010	2016.08.23	√
7	Electric Vehicle Battery Tester	BNT100-0100ME	ITCB13011	2016.08.23	√
8	Temperature Recorder	MV2020	ITCS11100001	2016.09.06	√
9	Digital Multicenter	FLUKE177	ITCS06060-3	2016.08.13	√
10	Battery internal resistance tester	BT3563	ITCB14001	2016.08.13	√
11	Battery Impact Tester	H-FZ-500	ITCEN07009	2017.04.20	√
12	High-precision battery tester	CT-3008W-20V6A-NTF	ITCS110201	2016.08.03	√
13	High-precision battery tester	CT-3008W-20V6A-NTF	ITCS110203	2016.08.03	√
14	Electronic Scale	BCS-ACSC-30	ITCS11030	2016.11.07	√
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TEST REPORT

Annex 1. Altitude Simulation

No	Battery Condition	Before Test OCV ₁ (V)	Before Test M ₁ (g)	After Test OCV ₂ (V)	After Test M ₂ (V)	OCV ₂ / OCV ₁ (%)	Mass Loss (M ₂ - M ₁)/ M ₁ (%)	Remarks
Group 1	First cycle fully charged	41.35	2673.5	41.34	2673.5	99.98%	0.000%	--
Group 2	First cycle fully charged	41.24	2689.5	41.24	2689.5	100.00%	0.000%	--
Group 3	First cycle fully charged	41.23	2686.0	41.23	2686.0	100.00%	0.000%	--
Group 4	First cycle fully charged	41.22	2682.5	41.21	2682.5	99.98%	0.000%	--
Group 5	After 50 cycles fully charged	41.35	2675.5	41.34	2675.5	99.98%	0.000%	--
Group 6	After 50 cycles fully charged	41.30	2656.5	41.30	2656.5	100.00%	0.000%	--
Group 7	After 50 cycles fully charged	41.34	2682.0	41.33	2682.0	99.98%	0.000%	--
Group 8	After 50 cycles fully charged	41.24	2682.5	41.23	2682.5	99.98%	0.000%	--
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Remarks:

NL: No leakage NV: No Venting ND: No Disassembly NR: No Rupture NF: No Fire

LK: Leakage VNT: Venting DSM: Disassembly RUP: Rupture FR: Fire

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Annex 2. Thermal Test

No	Battery Condition	Before Test OCV ₁ (V)	Before Test M ₁ (g)	After Test OCV ₂ (V)	After Test M ₂ (V)	OCV ₂ / OCV ₁ (%)	Mass Loss (M ₂ -M ₁)/ M ₁ (%)	Remarks
Group 1	First cycle fully charged	41.34	2673.5	41.02	2673.0	99.23%	0.019%	—
Group 2	First cycle fully charged	41.24	2689.5	40.95	2689.0	99.30%	0.019%	--
Group 3	First cycle fully charged	41.23	2686.0	40.96	2685.0	99.35%	0.037%	--
Group 4	First cycle fully charged	41.21	2682.5	40.91	2681.5	99.27%	0.037%	--
Group 5	After 50 cycles fully charged	41.34	2675.5	41.01	2675.0	99.20%	0.019%	--
Group 6	After 50 cycles fully charged	41.30	2656.5	41.01	2656.0	99.30%	0.019%	--
Group 7	After 50 cycles fully charged	41.33	2682.0	41.01	2681.0	99.23%	0.037%	--
Group 8	After 50 cycles fully charged	41.23	2682.5	40.93	2682.0	99.27%	0.019%	--
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Remarks:**NL:** No leakage **NV:** No Venting **ND:** No Disassembly **NR:** No Rupture **NF:** No Fire**LK:** Leakage **VNT:** Venting **DSM:** Disassembly **RUP:** Rupture **FR:** Fire

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TEST REPORT

Annex 3. Vibration

No	Battery Condition	Before Test OCV ₁ (V)	Before Test M ₁ (g)	After Test OCV ₂ (V)	After Test M ₂ (V)	OCV ₂ / OCV ₁ (%)	Mass Loss (M ₂ - M ₁)/ M ₁ (%)	Remarks
Group 1	First cycle fully charged	41.02	2673.0	41.01	2673.0	99.98%	0.000%	--
Group 2	First cycle fully charged	40.95	2689.0	40.94	2689.0	99.98%	0.000%	--
Group 3	First cycle fully charged	40.96	2685.0	40.96	2685.0	100.00%	0.000%	--
Group 4	First cycle fully charged	40.91	2681.5	40.90	2681.5	99.98%	0.000%	--
Group 5	After 50 cycles fully charged	41.01	2675.0	41.00	2675.0	99.98%	0.000%	--
Group 6	After 50 cycles fully charged	41.01	2656.0	41.00	2656.0	99.98%	0.000%	--
Group 7	After 50 cycles fully charged	41.01	2681.0	41.01	2681.0	100.00%	0.000%	--
Group 8	After 50 cycles fully charged	40.93	2682.0	40.92	2682.0	99.98%	0.000%	--
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Remarks:

NL: No leakage NV: No Venting ND: No Disassembly NR: No Rupture NF: No Fire

LK: Leakage VNT: Venting DSM: Disassembly RUP: Rupture FR: Fire

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Annex 4. Shock

No	Battery Condition	Before Test OCV ₁ (V)	Before Test M ₁ (g)	After Test OCV ₂ (V)	After Test M ₂ (V)	OCV ₂ / OCV ₁ (%)	Mass Loss (M ₂ - M ₁)/ M ₁ (%)	Remarks
Group 1	First cycle fully charged	41.01	2673.0	41.00	2673.0	99.98%	0.000%	--
Group 2	First cycle fully charged	40.94	2689.0	40.94	2689.0	100.00%	0.000%	--
Group 3	First cycle fully charged	40.96	2685.0	40.95	2685.0	99.98%	0.000%	--
Group 4	First cycle fully charged	40.90	2681.5	40.90	2681.5	100.00%	0.000%	--
Group 5	After 50 cycles fully charged	41.00	2675.0	40.99	2675.0	99.98%	0.000%	--
Group 6	After 50 cycles fully charged	41.00	2656.0	41.00	2656.0	100.00%	0.000%	--
Group 7	After 50 cycles fully charged	41.01	2681.0	41.00	2681.0	99.98%	0.000%	--
Group 8	After 50 cycles fully charged	40.92	2682.0	40.91	2682.0	99.98%	0.000%	--
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Remarks: NL: No leakage NV: No Venting ND: No Disassembly NR: No Rupture NF: No Fire LK: Leakage VNT: Venting DSM: Disassembly RUP: Rupture FR: Fire								

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Annex 5. External Short Circuit

No	Battery Condition	Voltage (V)	Initial Temperature (°C)	Max Temperature (°C)	Remarks
Group 1	First cycle fully charged	41.00	55.1	55.6	--
Group 2	First cycle fully charged	40.94	55.1	55.8	--
Group 3	First cycle fully charged	40.95	55.2	55.4	--
Group 4	First cycle fully charged	40.90	55.1	55.8	--
Group 5	After 50 cycles fully charged	40.99	55.2	55.7	--
Group 6	After 50 cycles fully charged	41.00	55.1	55.6	--
Group 7	After 50 cycles fully charged	41.00	55.1	55.5	--
Group 8	After 50 cycles fully charged	40.91	55.1	55.8	--
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Remarks:

NL: No leakage **NV:** No Venting **ND:** No Disassembly **NR:** No Rupture **NF:** No Fire
LK: Leakage **VNT:** Venting **DSM:** Disassembly **RUP:** Rupture **FR:** Fire

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Annex 6. Impact

No	Battery Condition	Voltage (V)	Initial Temperature (°C)	Max Temperature (°C)	Remarks
1	First cycle in 50% rated capacity	3.463	25.0	113.2	--
2	First cycle in 50% rated capacity	3.464	24.8	37.6	--
3	First cycle in 50% rated capacity	3.464	24.5	90.3	--
4	First cycle in 50% rated capacity	3.462	24.5	100.3	--
5	First cycle in 50% rated capacity	3.462	25.1	117.0	--
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Remarks:

NL: No leakage **NV:** No Venting **ND:** No Disassembly **NR:** No Rupture **NF:** No Fire

LK: Leakage **VNT:** Venting **DSM:** Disassembly **RUP:** Rupture **FR:** Fire

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Annex 7. Overcharge

No	Battery Condition	Voltage (V)	Initial Temperature (°C)	Max Temperature (°C)	Remarks
9 Group	First cycle in fully charged	41.31	23.3	24.8	--
10 Group	First cycle in fully charged	41.23	23.3	24.5	--
11 Group	First cycle in fully charged	41.26	23.2	24.9	--
12 Group	First cycle in fully charged	41.30	23.3	24.6	--
13 Group	After 50 cycles in fully charged	41.31	23.3	24.5	--
14 Group	After 50 cycles in fully charged	41.27	23.3	24.5	--
15 Group	After 50 cycles in fully charged	41.26	23.2	24.8	--
16 Group	After 50 cycles in fully charged	41.29	23.3	24.7	--
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Remarks: NL: No leakage NV: No Venting ND: No Disassembly NR: No Rupture NF: No Fire LK: Leakage VNT: Venting DSM: Disassembly RUP: Rupture FR: Fire					

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Annex 8. Force Discharge

No	Battery Condition	Voltage (V)	Initial Temperature (°C)	Max Temperature (°C)	Remarks
6 #	First cycle in fully charged	3.261	23.3	84.8	--
7#	First cycle in fully charged	3.260	23.3	76.3	--
8#	First cycle in fully charged	3.217	23.3	83.5	--
9#	First cycle in fully charged	3.194	23.2	73.9	--
10#	First cycle in fully charged	3.196	23.2	84.6	--
11#	First cycle in fully charged	3.203	23.2	78.2	--
12#	First cycle in fully charged	3.172	23.3	77.6	--
13#	First cycle in fully charged	3.260	23.3	89.2	--
14#	First cycle in fully charged	3.195	23.3	86.3	--
15#	First cycle in fully charged	3.199	23.2	76.3	--
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Remarks: NL: No leakage NV: No Venting ND: No Disassembly NR: No Rupture NF: No Fire LK: Leakage VNT: Venting DSM: Disassembly RUP: Rupture FR: Fire					

CQC Intime Testing Technology Co., Ltd

TEST REPORT

Annex 8. Force Discharge

No	Battery Condition	Voltage (V)	Initial Temperature (°C)	Max Temperature (°C)	Remarks
16#	After 50 cycles in fully charged	3.260	23.3	84.2	—
17#	After 50 cycles in fully charged	3.261	23.3	84.9	—
18#	After 50 cycles in fully charged	3.262	23.2	75.2	—
19#	After 50 cycles in fully charged	3.308	23.2	86.7	—
20#	After 50 cycles in fully charged	3.261	23.3	78.8	—
21#	After 50 cycles in fully charged	3.298	23.2	79.3	—
22#	After 50 cycles in fully charged	3.264	23.3	82.3	—
23#	After 50 cycles in fully charged	3.256	23.2	86.5	—
24#	After 50 cycles in fully charged	3.255	23.2	76.2	—
25#	After 50 cycles in fully charged	3.263	23.2	88.6	—
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Remarks:

NL: No leakage **NV:** No Venting **ND:** No Disassembly **NR:** No Rupture **NF:** No Fire
LK: Leakage **VNT:** Venting **DSM:** Disassembly **RUP:** Rupture **FR:** Fire

Unless otherwise stated, All of the above tests were conducted at 20 ± 5 °C .

—End—

